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Specifikacija za zidake ï 2. del: Apneno peġļeni zidaki

Specification for masonry units - Part 2: Calcium silicate masonry units

Festlegungen für Mauersteine - Teil 2: Kalksandsteine

Spécifications pour éléments de maçonnerie - Partie 2 : Éléments de maçonnerie en silico-calcaire

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This European Standard was approved by CEN on 2 October 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (EN 771-2:2003) has been prepared by Technical Committee CEN/TC 125 '*Masonry*', the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by January 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports the essential requirements of the EU Construction Products Directive (89/106/EEC).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

It also takes into account the general rules for reinforced and unreinforced masonry in Eurocode 6.

The annexes A, B and C of this documentare normative, the annexes D and ZA are informative.

This document supersedes EN 771-2:2000.

EN 771 *Specification for masonry* units consists of:

— Part 1: Clay masonry units

— Part 2: Calcium silicate masonry units

— Part 3: Aggregates concrete masonry units (dense and light-weight aggregates)

— Part 4: Autoclaved aerated concrete masonry units

— Part 5: Manufactured stone masonry units

— Part 6: Natural stone masonry units

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This document specifies the characteristics and performance requirements of calcium silicate masonry units for which the main intended uses are inner walls, outer walls, cellars, foundations and external chimneymasonry.

This document is intended to apply to all calcium silicate masonry units, including those of an overall nonrectangular parallelepiped shape, specially shaped and accessory units.

It defines the performance related to e.g. strength, density and dimensional accuracy, measured according to the corresponding test methods contained in separate European Standards.

It provides for the evaluation of conformity of the product to this European Standard. The marking requirement for products covered by this document is also included.

This document does not specify standard sizes for calcium silicate masonry units, nor standard work dimensions and angles of specially shaped and accessory units.

It does not cover units with more than 60 % volume of voids, nor products made from shale as a major raw material.

It does not cover storey height panels.

It does not cover units intended for use as a damp proof course, nor units with an incorporated thermal insulation material bonded to the faces of the unit susceptible to be exposed to fire nor chimney flue units.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 772-1:2000, *Methods of test for masonry units — Part 1: Determination of compressive strength*

EN 772-9, *Methods of test for masonry units — Part 9: Determination of volume and percentage of voids and net volume of calcium silicate units by sand filling*

EN 772-13:2000, *Methods of test for masonry units — Part 13: Determination of net and gross dry density of masonry units (except for natural stone)*

EN 772-16:2000, *Methods of test for masonry units — Part 16: Determination of dimensions*

EN 772-18:2000, *Methods of test for masonry units — Part 18: Determination of freeze/thaw resistance of calcium silicate masonry units*

EN 1052-3, *Methods of test for masonry — Part 3: Determination of initial shear strength*

EN 1745, *Masonry and masonry products — Methods for determining design thermal values*

EN ISO 12572, Hygrothermal performance of building materials and products *Determination of water vapour transmission properties (ISO 12572:2001)*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
masonry unit
preformed component intended for use in masonry construction

3.2
calcium silicate masonry unit
masonry unit made predominantly from lime and siliceous materials, hardened by high pressure steam

3.3
shale
fine grained sedimentary rock, finely laminated and consisting of mainly quartz and clay minerals

3.4
co-ordinating size
size of the co-ordinating space allocated to a masonry unit including allowances for joints and tolerances

3.5
work size
size of a masonry unit specified for its manufacture, to which the actual size conforms within permissible deviations

3.6
actual size
size of a masonry unit as measured

3.7
regular shaped masonry unit
masonry unit with an overall rectangular parallelepiped shape

3.8
specially shaped masonry unit
masonry unit which is not a rectangular parallelepiped

3.9
accessory unit
masonry unit which is shaped to provide a particular function, e.g. to complete the geometry of the masonry. It may be obtained by cutting a large unit

3.10
interlocking feature
shaped matched projections and indentations on masonry units, e.g. tongue and groove systems

3.11
hole
formed void which may or may not pass completely through a masonry unit

3.12
perforation
formed void which passes completely through a masonry unit

3.13
cell
formed void which does not pass through a masonry unit

3.14
frog
depression formed in one or both faces of a unit, the total volume of all such depressions which does not exceed a certain limit of the overall volume of the unit i.e. length × width × height

3.15
recess
a depression or indentation in one or more surfaces of a masonry unit (e.g. mortar pocket, rendering keyway, grip hole)

3.16
shell
peripheral material between the hole(s) and the outer surfaces of a masonry unit

3.17
web
solid material between the holes in a masonry unit

3.18
normalized compressive strength of masonry units
compressive strength of masonry units converted to the air dry compressive strength of an equivalent 100 mm wide and 100 mm high masonry unit

NOTE See procedure given in Annex A of EN 772-1:2000

3.19
mean compressive strength of masonry units
arithmetic mean of the compressive strengths of masonry units

3.20
characteristic compressive strength of masonry units
compressive strength corresponding to the 5 % fractile of the compressive strength of masonry units

3.21
declared value
value that a manufacturer is confident of achieving, bearing in mind the precision of the test and the variability of the manufacturing process

3.22
Category I masonry units
units with a declared compressive strength with a probability of failure to reach it not exceeding 5 %. This may be determined via the mean or characteristic value

3.23
Category II masonry units
units not intended to comply with the level of confidence of Category I units

4 Materials and manufacture

Calcium silicate masonry units are produced predominantly from a mixture of lime and natural siliceous materials (sand, crushed or uncrushed siliceous gravel or rock or a mixture thereof), hardened by high pressure steam.

Calcium silicate masonry units produced with a majority of other siliceous materials are permitted if these materials have no deleterious effect on the properties of the product. The presence of such a material shall be declared.

5 Requirements for calcium silicate masonry units

5.1 General

The requirements and properties specified in this European Standard shall be defined in terms of the test methods and other procedures referred to in this European Standard.

It should be noted that the test methods are not always applicable to specially shaped and accessory units as defined in 3.8. and 3.9.

The conformity criteria given in the following sub-clauses relate to initial type testing (see 8.2) and, when relevant, to consignment testing (see annex A). For the compressive strength of Category I units use a 50 %-fractile (p=0,50) for mean values and a confidence level of 95 %.

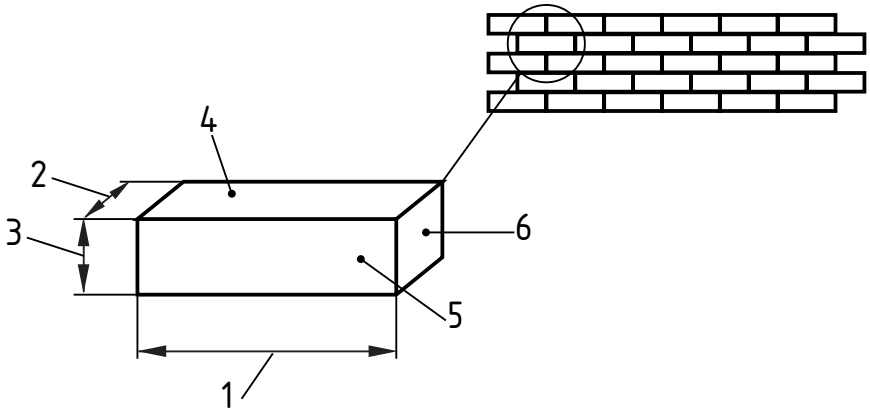
For production evaluation the manufacturer shall define the conformity criteria in the factory production control documentation (see 8.3).

5.2 Dimensions and tolerances

5.2.1 Dimensions

The dimensions of a calcium silicate masonry unit shall be declared in mm for length, width and height, in that order. They shall be given in terms of work size.

NOTE Iin addition the co-ordinating size may be given. see Figure 1.



Key

1	Length	2	Width	3	Height
4	Bed	5	Face	6	Header

NOTE This relates to the normal use of the masonry unit in the wall.

Figure 1 — Dimensions and surfaces

When a specified number of calcium silicate masonry units is sampled from a consignment in accordance with annex A and tested in accordance with EN 772-16 the tolerances shall be as indicated in 5.2.2. The determination of length, width and height shall be by one measurement taken approximately in the centre of each specimen (7.1 of EN 772-16:2000 method b)). When there is a need to exclude irregular surfaces (tongues and grooves, grip holes, etc.) in providing the dimension, method a) shall be used.

Dimensions and tolerances for accessory units shall be as given in annex C.

5.2.2 Tolerances

The actual deviations for the mean length, width and height and the actual deviations for individual length, width and height shall be not greater than the permissible deviations as specified in Table 1.

Closer tolerances may be declared for one or more dimensions.

Actual deviations for the mean are differences between declared work sizes and the mean measured values. Actual deviations for individual values are differences between the mean measured values and the measured individual values.

These dimensional tolerances shall not apply to the direction perpendicular to the face of fracturing in a one-side sliced unit.

Table 1 — Dimensional tolerances for calcium silicate masonry units (in millimetres)

Dimensions	Calcium silicate masonry units for use with joints made of:	
	general purpose mortar and light-weight mortar	thin layer mortar
Mean height of sample	work size height ± 2	work size height ± 1
Mean length of sample	work size length ± 2	work size length ± 2
Mean width of sample	work size width ± 2	work size width ± 2
Individual height	mean height of sample ± 2	mean height of sample ± 1
Individual length	mean length of sample ± 2	mean length of sample ± 2
Individual width	mean width of sample ± 2	mean width of sample ± 2
NOTE For definition of general purpose mortar, light-weight mortar and thin layer mortar see 3.3 of EN 998-2:2003		

5.3 Configuration

The configuration of perforations, cells, shells and webs shall be declared. No tolerances are given for these.

NOTE The manufacturer may also declare, whether the units comply with the limits for one or another of the groups specified in relevant parts of Eurocode 6.

The total volume of frogs shall not exceed 20 % of the overall volume of the unit, i.e. length × width × height.

5.4 Dry density

5.4.1 Gross dry density

The manufacturer shall declare a minimum and a maximum value for the gross dry density. The manufacturer may declare the gross dry density class according to annex D.2.

When a specified number of calcium silicate masonry units is sampled from a consignment in accordance with annex A and tested and in accordance with EN 772-13, the mean gross density shall comply with this declared values or declared density class.

5.4.2 Net dry density

If necessary for the intended use the manufacturer shall declare a minimum and a maximum value for the net dry density. When a specified number of calcium silicate masonry units is sampled from a consignment in accordance with annex A and tested in accordance with EN 772-13 the mean net dry density shall comply with this declared values.

5.5 Compressive strength

The mean compressive strength shall be declared by the manufacturer. The manufacturer shall also declare the normalised compressive strength. This may be done according to the classification in annex D.1.

NOTE EN 772-1 gives instructions on how to convert the mean compressive strength into the normalised compressive strength.

In addition the manufacturer shall declare whether the calcium silicate masonry unit is Category I or Category II (see annex ZA.2).

The declaration shall relate to and indicate the orientation(s) of the calcium silicate masonry units as tested, the method(s) of bedding the calcium silicate masonry units and whether voids present are intended to be fully filled with mortar. The declared value shall be not less than 5 N/mm^2.

When a specified number of calcium silicate masonry units is sampled from a consignment in accordance with annex A and tested in accordance with EN 772-1 the mean compressive strength shall not be less than the declared value.

When a strength class is declared the mean normalised compressive strength shall be not less than the value for the strength class declared.

Individual values of compressive strength as determined in accordance with EN 772-1 shall be not less than 80 % of the declared value.

When a strength class is declared the individual normalised compressive strength values within a sample as tested shall be not less than 80 % of the value for the declared compressive strength class according to the classification in annex D.1.

For calcium silicate masonry units with lengths ≥ 500 mm and/or heights ≥ 300 mm representative portions may be cut for determination of compressive strength as specified in annex B. In all other cases whole calcium silicate masonry units shall be tested.

The mean value of the compressive strength of three pieces cut according to annex B from any calcium silicate masonry unit in a sample shall be not less than 90 % of the declared value. When a strength class is declared the mean value of the compressive strength of three pieces cut according to annex B from any one calcium silicate masonry unit in a sample shall be not less than 90 % of the value for the corresponding class as defined in annex D.1. If the specimen does not meet the requirement of 7.2.1 of EN 772-1:2000 it shall be ground.

The condition of the calcium silicate masonry units shall be oven dry as specified in 7.3.3. a) of EN 772-1:2000.

5.6 Thermal properties

When relevant to the uses for which the unit is put on the market and in all cases for masonry units intended to be used in elements subject to thermal insulation requirements, the manufacturer shall provide information on the thermal properties of the masonry units. If so it shall be done by reference to EN 1745 or alternatively to 5.3 and 5.4.

5.7 Durability

Calcium silicate masonry units to be used where there is a risk of freezing and thawing while in a wet condition, shall be declared by the manufacturer to be freeze/thaw resistant for structural use and visual aspects or for structural use only. When a specified number of calcium silicate masonry units is sampled from a consignment in accordance with annex A and tested in accordance with EN 772-18,